Imperial Agricultural Bureaux
Seventeenth Annual Report
OF THE
Executive Council
1945-1946

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1947

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IMPERIAL AGRICULTURAL BUREAUX

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PREFACE

The Imperial Agricultural Research Conference, 1927, stressed (*a*) the need for scientists to be in touch with the progress of research throughout the world in their several branches, and (*b*) the difficulty therein owing to the great output of scientific literature and the diversity of languages in which it is published.

2. It recommended the Governments of the British Commonwealth to establish on a joint co-operative basis eight bureaux to collect, collate and disseminate information on research in eight selected branches of agricultural science and generally to assist research workers in the Empire with information relevant to their subjects. Each bureau was to be located at a research Institute specializing in its own branch of science so that the bureau officers should be in daily contact with men engaged on research in its own subject. These bureaux were to be financed from a common fund contributed by Empire Governments in agreed proportions and controlled by a Council composed of representatives of those governments on an equal footing.

3. Governments accepted these proposals. In November, 1928, a new type of inter-Imperial co-operative agency acceptable to all governments was worked out in detail. On 1st April, 1929, the Executive Council of the Imperial Agricultural Bureaux came into being. The eight bureaux started work in that year.

4. Following the Ottawa Conference of 1932 the work of several inter-Imperial agencies was examined and reported upon by the Imperial Committee on Economic Consultation and Co-operation (1933). This Committee approved of the bureaux organization and of its work, and extended the duties of the Council, *inter alia* proposing that with effect from 1st October, 1933, it should also be responsible for the supervision and administration and finance of the Imperial Institute of Entomology and of the Imperial Mycological Institute.

5. It also enunciated certain general principles to be observed in regard to the organization of agencies for inter-Imperial co-operation and consultation, *e.g.*, Constitutional equality of participating governments in the appointment of the Authority administering the work; the provision of adequate finance for a definite period of years; careful and periodical examination of the work and organization of the Agency at Empire conferences suitable for the purpose, as without that assurance governments could hardly be expected to provide the adequate continuing finance; responsibility of the administering authority to all participating governments. All Governments accepted this report.

6. The British Commonwealth Scientific Conference (1936) conducted the first of these "periodical examinations." It approved both the work and organization. It recommended the finance necessary until 1941/42 (extended later to cover the war period), its distribution between governments, also the formation of two more bureaux, and certain modifications in practice designed to improve general efficiency. Governments accepted these proposals.

7. The organizations under the administration of the Executive Council are :—

The Imperial Institute of Entomology, with its branch, the Imperial Parasite Service.

The Imperial Mycological Institute and the Imperial Bureaux of

Soil Science.
Animal Health.
Animal Nutrition.
Animal Breeding and Genetics.
Plant Breeding and Genetics.
Pastures and Forage Crops.
Horticulture and Plantation Crops.
Agricultural Parasitology (Helminthology).
Dairy Science.
Forestry.

8. A "liaison" officer appointed by the appropriate department in each participating country keeps in touch with administrative matters, and in each country for each bureau a scientific officer is nominated as Official Correspondent to be "the general friend" on scientific matters of that bureau in that country. The Heads of the several Institutes at which bureaux are located act as Consultant Directors of the bureaux, thus giving the Council and bureaux the benefit of their wide experience and scientific knowledge. All other officers are whole-time servants of the Executive Council.

As a measure for paper economy, the usual list of publications has been omitted from this report. Copies of the 1947 list are, however, available for those desirous of consulting them, and will be supplied on application to :

The Imperial Agricultural Bureaux, Central Sales Branch,
Agricultural Research Building, Penglais, Aberystwyth, Wales,
or to the Secretary, Imperial Agricultural Bureaux,
2, Queen Anne's Gate Buildings, Dartmouth Street, London, S.W.1.

REPORT

At its meeting on the 25th February, 1947, the Executive Council of the Imperial Agricultural Bureaux adopted the following report on its seventeenth year's work—1st April, 1945 to 31st March, 1946.

2. The cessation of hostilities was the dominant fact of the year. The struggle back to peace conditions began. The chief difficulties arose from causes confronting most organizations; changes in personnel, the search for trained staff, delays in fulfilling orders, increased current demands combined with overtaking work deferred on account of the war, initial arrangements for the years immediately ahead and the all-pervading effect of rising prices. Many of these causes will persist for some years; but progress in adaptation to post-war conditions was made during the year. The most important step for future work was the decision of governments to take part in a Review Conference in the summer of 1946.

The Review Conference of 1946

3. A cardinal condition for the working of any inter-Imperial co-operative agency is that its activities be periodically reviewed at "conferences suitable for that purpose" and specially appointed by governments for that task. Without such periodical reviews neither could governments be expected to provide the continuous financial support required nor could the activities of the organizations be kept in harmony with current needs. In the case of the Executive Council, such an examination should have been held in 1941. It was long overdue. That within eleven months of the close of hostilities a specially appointed Conference had met and completed its task is a great help to the Council's work, both immediate and future. Governments, faced with insistent post-war perplexities, might understandably have postponed such a Conference. Its early assembly was undoubtedly due to the fairly widespread desire among the countries of the British Commonwealth for closer co-operation in science generally. The interchange of scientific information, the pooling of scientific resources and endeavour had been greatly developed during the war. The wish grew to adapt and to develop such relations in the years of peace which were to come. The Royal Society in London took the initiative. It had broached the question in 1941 and in 1942, and, well before the end of the war, it, with the approval of His Majesty's Government in the United Kingdom, had been sounding official scientific departments in countries overseas on the desirability, possibility and scope of a general British Commonwealth Scientific Conference to be assembled in London as soon after the close of hostilities as possible. The proposal, which involved much preliminary work, gained general support, with the result that in July, 1945, His Majesty's Government in the United Kingdom formally invited overseas governments to take part in such a Conference to assemble in the summer of 1946, and concurrently with or as a complement to it, to hold a Conference "between the civil government scientific organizations of the Commonwealth to consider the best means of ensuring the fullest possible collaboration between them." These proposals, much wider in their conception than a Review Conference of the Bureaux but not providing for many of the specific details which would come before a Review Conference, did, none the less, clearly concern the Executive Council as being the only existing agency formed on a co-operative official basis for the organized collection and interchange of scientific information in its application to one of the great fields of human activity, *viz.*, agriculture in its widest sense. Also, several of the delegates from overseas countries who would attend these Conferences were interested in the detailed matters affecting the Bureaux. Accordingly, in the same despatch His Majesty's Government suggested that these two more general Conferences should be immediately followed by the overdue Bureaux Review Conference. All governments accepted these proposals. The three interlocked Conferences were held in London in June-July, 1946. Several delegates were Members of all three Conferences and each Conference took into consideration the recommendations of its predecessor in so far as that directly affected its own work. An account of the Review Conference belongs to the Executive Council's Administration Report for 1946–47, but much of the preliminary work was done in 1945–46 and the Reports of all the three Conferences should be available by the time this report is published.

F.A.O.—Informal Conference

4. Preliminaries for another and much shorter Conference were also arranged in 1945–46. The Food and Agriculture Organization of the United Nations (F.A.O.) had been formally established at Quebec in September, 1945. It called an informal meeting of experts on Statistical, Scientific and Technical Information Services to meet in London, 10th–13th April, 1946. Officers of the Executive Council and of the Bureaux were

invited to take part. Fourteen countries and five international organizations participated. The report of the Conference has been published in F.A.O. Service Bulletin, Vol. I, No. 4. The portion of most interest to the Bureaux is that headed—"Publication Services." It is reproduced as Appendix I to this Report.

Changes in Personnel, in the Executive Council and in the Institutes and Bureaux

5. The Council regrets to have to record the loss through death of one of its Members—Mr. D. J. Davies, C.B.E., the representative of Newfoundland.

Some changes in the Council were of a temporary nature due to governments reshuffling their senior officers at the end of the war. Mr. W. R. Black, M.B.E., Mr. G. Gresford or Mr. L. Lewis and Mr. W. B. England, M.B.E., deputized for most of the year for Sir Donald Fergusson (United Kingdom), Mr. F. L. McDougall, C.M.G. (Australia), and Sir David Meek (India) respectively.

Among permanent changes, Dr. I. E. Coop succeeded Mr. A. L. Poole as the representative of New Zealand but was himself recalled to New Zealand later in the year, without a successor being appointed. In November, 1945, Mr. T. G. Gisborne joined the Council as the representative of Southern Rhodesia. In March, 1946, Sir Gerald Creasy, K.C.M.G. (Colonies, Protectorates and Mandated Territories), who had been Chairman of the Executive Council, resigned his seat as he would have to be repeatedly absent in West Africa.

6. Thus at the close of 1945–46 there were several permanent vacancies on the Executive Council. Some of these, however, were filled well before the Review Conference assembled in June, 1946. Sir Patrick R. Laird, C.B., F.R.S.E., was nominated by the Government of the United Kingdom, Mr. M. K. Vellodi, C.I.E., by the Government of India and Mr. C. Y. Carstairs by H.M. Secretary of State for the Colonies, Protectorates and Mandated Territories.

7. Changes also occurred among senior officers in the Institutes and Bureaux. Sir John Boyd Orr, D.S.O., M.C., F.R.S., ceased to be Consultant Director of the Bureau of Animal Nutrition, having become in October, 1945, the first Director-General of the Food and Agriculture Organization of the United Nations, Mr. J. W. B. Sisam resigned the Directorship of the Forestry Bureau on his appointment as Associate Professor of Forestry, Toronto, Mr. A. E. Fountain resigned from the Deputy Directorship of the Bureau of Agricultural Parasitology, Mr. G. St. Clair Feilden retired from the Bureau of Horticulture and Plantation Crops and Dr. Hugh Nicol, D.Sc., and Dr. G. A. Ainsworth resigned their posts in the Bureau of Soil Science and in the Mycological Institute on their respective appointments as Professor of Agricultural Chemistry at the West of Scotland Agricultural College and as Head of the Mycological Department of the Wellcome Physiological Research Laboratories.

8. Sir John Orr had always taken great personal interest in the bureaux. As Head of the Rowett Research Institute he started and developed the Bureau of Animal Nutrition and with the late Sir Morley Fletcher was mainly instrumental in arranging that it also covered Human Nutrition. The Council wishes to acknowledge its debt to Sir John's constant sage advice and lively enthusiasm. Both the Executive Council and the bureaux owe much to those who in 1929 were Heads of the Research Institutes at which the bureaux were located. Only two of those who took part in that initial work in 1929 were still Heads of their Institutes at the close of 1945–46; Dr. Hatton, F.R.S., and Professor Leiper, F.R.S.

9. Mr. Sisam came from Canada in 1939 to be the first Director of the Forestry Bureau. His time as Director coincided with the hampering and difficult years of war. Opportunities for developing his bureau were therefore limited, but he showed much energy and resource and was a very welcome member of the group of bureaux officers.

10. All changes in staff in the bureaux and institutes were not, however, transfers or resignations. Dr. D. P. Cuthbertson, who had succeeded Sir John Orr as Director of the Rowett Research Institute was appointed Consultant Director of the Bureau of Animal Nutrition. Difficulty arose in filling Mr. Sisam's post but no interregnum occurred. Dr. C. F. C. Beeson, C.I.E., formerly Forest Entomologist at the Forestry Research Institute, Dehra Dun, India, kindly took charge at once. He was still officiating at the end of the financial year.

Mr. M. G. Crawford, M.R.C.V.S., joined the Bureau of Animal Health direct from Ceylon, where he had been Director of the Veterinary Department. Dr. H. Wormald, D.Sc., who had just retired from the East Malling Research Station where for many years he had been Head of the Mycological Section, joined the Bureau of Horticulture and Plantation Crops. In August, 1945, Mr. S. H. Hughes was appointed an Assistant Mycologist at the Imperial Mycological Institute.

Mr. A. P. Kapur, Senior Assistant Entomologist, Kashmir, was deputed by his Government for three years to work in the Imperial Institute of Entomology. He was appointed as an Assistant Entomologist in the Institute, supernumerary to establishment.

On the administrative side, Mr. A. H. Ross, as mentioned in the report for 1944–45, was appointed to Headquarters in the vacancy caused by the death of Mr. E. J. Rae. Also, on the administrative side the Central Sales Branch was strengthened by the appointment of Mr. I. A. Owen.

Titles of Bureaux Officers: Consultant Directors and Directors

11. When the bureaux were established in 1929, the Head of the Research Institute, at which a Bureau was located, was styled Director of the Bureau and the Chief Operative Officer in the Bureau, Deputy Director. Lord Hankey's Committee (see the 1942–43 Administration Report) pointed out that these titles were misleading. The Chief Officer in a bureau is appointed by the Executive Council and is not in any sense a Deputy for the Head of the Research Institute, who is quite differently appointed. Also, whilst his relations with the Head of the Institute must be close and he should turn to that Head for advice and assistance, he and not the Head of the Institute is directly responsible for the detailed information issued by a Bureau. Lord Hankey's Committee recommended that these officers should be entitled respectively Consultant Director and Director. This has been done.

Establishment Questions

12. In the four previous Administration Reports, those for 1941–42 to 1944–45, attention was drawn with increasing emphasis to the adverse effect which rising costs due to war conditions were having on the finances of the Institutes and Bureaux. In May, 1944, the Executive Council brought to the notice of Governments the position of the Bureaux, pointing out the impossibility of continuing beyond 1944–45 on the then scale of contributions. A temporary increase in contributions based on the conditions in the Spring of 1944 was asked for pending the assembly of a regularly constituted Review Conference. These increases were based on the scale of war bonuses prevailing in the Spring of 1944 but also allowed partial effect to be given forthwith to a recommendation of Lord Hankey's Committee that Directors of Bureaux should receive salaries similar to those of a Principal Scientific Officer in a Research Institute in the United Kingdom. Governments provided these extra funds on this temporary basis with effect from 1st April, 1945. A beginning was made in making the salaries of Directors comparable with those of Principal Scientific Officers.

13. War Bonuses were, however, again raised substantially throughout the United Kingdom in November, 1945. H.M. Government in the United Kingdom directed that bonuses should be consolidated with basic salaries and also in the year 1945–46 had issued revised scales of salary for scientific staff in civil departments. These orders set the plan for such salaries in the United Kingdom for the immediate post-war years. The Review Conference was due to meet in the summer of 1946. During the latter part of 1945–46 the Executive Council gave much attention to the revision of salaries on the basis of these Treasury rulings. Consolidated scales were introduced early in 1946.

Overseas visits by Senior Officers

14. The war broke many foreign contacts. It stopped overseas and foreign visits. Immediately the war ended there was a surge to know what had happened to research centres in occupied and enemy countries and to procure copies of publications unobtainable during the war. But time was needed. Disorganization was too complete. At a very early date, however, the Military Authorities organized small parties of specialists, to visit Germany and report. Mr. G. V. Jacks, as a member of a small selected group of soil scientists, was among the earliest to visit Germany. Later in the year Dr. P. S. Hudson went there twice with a group of plant specialists. Through these officers the Bureaux obtained early information of general conditions and of the chances, in some cases very remote, of obtaining copies of missing publications. Dr. Hudson, however, succeeded in obtaining some experimental breeding material in potatoes and sweet lupin seeds.

15. All specialist libraries, and not only the bureaux, had been unable during the war to obtain copies of many publications issued in enemy countries. Later in the year, under the organization of the Military Authorities an attempt was made to tabulate all these deficiencies and to endeavour to secure copies. The bureaux took part in this scheme.

16. Mr. W. G. Sutton, Director of the Bureau of Dairy Science, made a short tour in Eire during the year and with the assistance of the Department of Agriculture saw the research institutes and many of the dairying centres there. At the request of the Colonial Office, Dr. R. O. Whyte, Director of the Bureau of Pastures and Forage Crops, went at two different seasons of the year to Cyprus and Palestine to report on questions relating to pastures and land use. Both these were very useful visits. In Dr. Whyte's case it also gave him an opportunity of seeing a system of agriculture with which he was not personally familiar. His case, however, illustrates a weakness in the existing staffing of

the bureaux. Although the desirability of visits by senior bureaux officers to Empire countries is constantly emphasized, it would have been impossible to have spared him from bureau work had not the Ministry of Agriculture allowed one of Sir George Stapledon's assistants, Mr. T. E. Williams, to take charge during his first absence and had not on the second occasion Mr. A. F. Beddows of the Welsh Plant Breeding Station taken charge with the consent of his Director. The Executive Council is grateful for the assistance given by these two; but obviously that kind of external help cannot be assured whenever a visit overseas by a bureau officer is desirable and possible.

17. Also, in the year, institutes and bureaux began again to hear from and to receive visits from European scientists with whom they had relations before the war. This was another very welcome result of the cessation of hostilities. The visits were few. They were mostly from France, but also from Denmark and Holland. One feature was common to all: the wish to secure copies of the abstract journals issued during the war and insistence on maintaining the continuity of this abstracting service.

General

18. Although a start in the resumption of these relations, in visits to countries in the British Commonwealth, in formal contacts with the F.A.O. and the decision of governments for an early assembly of a Review Conference were definite steps to peace-time work, the general drag-over of war conditions continued, producing in many bureaux congestion of work and a feeling of being overwhelmed. These resulted from the receipt of numerous foreign publications unobtainable during the war, coupled with shortages of abstractors and typists, whilst prolonged delays in printing upset the general rhythm of production. These difficulties will be surmounted in time and the feeling of pressure, as evident at the end of 1945–46, will be relieved. But taking a longer view, though there are very many who do not use or even know the bureaux, there is no doubt that as a result of the continuance of the bureau work during the war years, of the efforts of the Central Sales Branch, of the work of Lord Hankey's Committee, the discussions in F.A.O. and of the preparations for the British Commonwealth Scientific Conference, the end of the war finds the bureaux organization more widely known than previously.

Publications

19. The bureaux could not escape and could not expect to escape from the restrictions placed on the use of paper during and following the war, though on account of the character of their publications, especially of the Abstract Journals, the Paper Controller always treated these journals with much consideration. Yet alterations in lay-out and limitations on the numbers of copies printed were unavoidable. He saw his way during the year to relax his conditions somewhat. This was very acceptable as the increase in the demand for these publications which had been noted in the reports for 1943–44 and 1944–45 gathered further force during 1945–46. It looks like continuing. But stocks of war-time issues are so limited that in some cases it may not be possible to meet all requests.

20. The usual statement of the receipts from sales of publications over a seven-year period is as follows:—

RECEIPTS FROM SALES OF PUBLICATIONS

	1939–40	1940–41	1941–42	1942–43	1943–44	1944–45	1945–46
	£	£	£	£	£	£	£
Imperial Institute of Entomology ..	2,037	1,798	1,885	1,692	2,236	2,811	4,018
Imperial Mycological Institute ..	904	670	843	799	1,333	1,616	2,166
The Bureaux, including Nutrition Abstracts and Reviews	5,910	5,247	6,443	5,468	6,607	8,750	11,305
	8,851	7,715	9,171	7,959	10,176	13,177	17,489

The figures for the several bureaux are :—

	1939–40	1940–41	1941–42	1942–43	1943–44	1944–45	1945–46
	£	£	£	£	£	£	£
Soil Science	478	358	399	308	372	471	661
Animal Health	1,146	1,084	1,174	1,219	1,474	1,688	2,291
Animal Nutrition	21	29	50	45	38	82	131
Animal Breeding and Genetics ..	203	227	188	232	305	528	874
Horticulture and Plantation Crops ..	393	286	417	308	412	794	887
Pastures and Forage Crops	413	422	348	250	336	688	1,032
Plant Breeding and Genetics	406	320	334	240	342	531	686
Agricultural Parasitology (Helminthology)	228	224	198	236	247	329	318
Dairy Science	335	283	270	300	323	378	636
Forestry	202	195	237	229	236	270	444
Headquarters	19	22	16	7	5	13	11
Total	3,844	3,450	3,631	3,374	4,090	5,772	7,971
Nutrition Abstracts and Reviews ..	2,066	1,797	2,057	2,098	2,501	2,951	3,318
5-year Index	—	—	755	—4	16	27	16
	5,910	5,247	6,443	5,468	6,607	8,750	11,305

21. This table, covering as it does seven years, happens to give a complete picture of the receipts from sales over the war years. The first column, that for 1939–40, was the last year of peace and the first of war. Receipts in that year (£8,851) had then only been surpassed in the previous year at £9,240. The last column, that for 1945–46, shows receipts at £17,489 or nearly twice the figure for 1939–40. Prices of occasional publications (Technical Communications) have been raised on account of increased costs of printing, but the rates of subscription to the journals are still as pre-war. The increases in the last two years are partly due to purchasers making up war arrears, to increased output of Technical Communications and a big demand for some of them, but each Institute and every bureau has its part in the increase (Comp. 1942–43 with the subsequent years, or 1939–40 with 1945–46) denoting a general increased demand for all the publications of all the bureaux. Pre-war subscriptions from, and sales to enemy and occupied countries will still take time to recover. The increased circulation is in Empire countries, in the U.S.A. and in Allied countries.

22. The figures above relate to sales and audited receipts therefrom. They take no account of the copies distributed free. Journals to a published value of £3,031 are sent, under the "quota" system, free to recipients in Empire countries nominated by the Liaison Officers of those countries. In the spring of 1946, the regular mailing list for the journals was as follows :—

	Numbers			
	Free "Quota"	Free, almost entirely exchange	Subscribers	Total
Countries of the British Commonwealth and Anglo-Egyptian Sudan	2,355	203	3,109	5,667
Foreign countries	—	663	3,329	3,992
Total	2,355	866	6,438	9,659

It is obvious that these journals have not yet reached the circulation they should attain.

23. The regular user of an abstract journal is the one who is likely to benefit most in the long run from organized information services such as the Institutes and Bureaux. A continuing reliable summary of current scientific information is not merely another book of reference for the library shelves but is part of the daily standard equipment of the working scientist. The Executive Council has made this point before in earlier reports but wishes again to emphasize it, for it is convinced that the officers in many departments in contributing countries are not drawing the full advantage they might from these services. In too many cases the copies of these journals are either retained at headquarters or sent round on a general circulation for cursory perusal, whereas they should be read, retained and referred to. They are, or should be, as useful to the University Lecturer and the trained man in the field as to the research worker. For what they contain the subscription rates are low. The expansion in receipts set out in paragraph 20 is encouraging in that it does contain a number of new subscribers to all the journals, but the figures given in the preceding paragraph shew that the total mailing list has not yet reached even 10,000, and much of the expansion of receipts in 1945–46 (in the case of the Imperial Institute of Entomology £1,000) is due to sales of back numbers of the journals—evidence, not infrequently, of a belated recognition of the usefulness of these journals.

24. Eight Technical Communications were issued by Bureaux during the year :—

	Issued by the Bureau of
The Semen of Animals and its use for Artificial Insemination.	Animal Breeding and Genetics.
The Application of Meteorology to Forest Fire Prevention.	Forestry.
Further work on Plant Injections for Diagnostic and Curative Purposes.	Horticulture and Plantation Crops.
Spring Frost Damage in Orchards and its Possible Prevention.	,, ,,
Ley farming in Sweden.	Pastures and Forage Crops.
The Establishment and Early Management of Sown Pastures.	,, ,,
New and Promising Varieties (6th Issue).	Plant Breeding and Genetics.
Forest Tree Breeding and Genetics.	Plant Breeding and Genetics and Forestry jointly.

In addition, the Bureau of Pastures and Forage Crops, following the practice of some other bureaux, *e.g.*, Horticulture and Plantation Crops, issued a consolidated "10 year Index." Cumulative Indexes covering 5 or 10 years issues of a journal are laborious to produce and costly to print. They cannot be sent free to all subscribers. Those already receive the annual index. Yet as the volumes of a journal increase as the years go by—several of the journals are now in their 17th and 18th year—a cumulative index covering 10 years or so is quite clearly a great saving of time and trouble to any seeking back references. These cumulative indexes may not appeal to the private subscriber to a journal, but it is reasonable to expect that they would be welcomed by librarians responsible for the custody of permanent central libraries in institutes or departments. It is a matter of surprise that the demand from these sources has been, on the whole, so small.

25. The list above refers only to occasional publications issued by the Bureaux. In addition to these and, of course, in addition to their regular periodicals, the Institute of Entomology issued ten papers on taxonomy and the Mycological Institute five. Also, at the request of the Agricultural Research Council the Institute of Entomology published "A Review on the Literature of Soil Insecticides" which had been prepared by Dr. H. C. Gough and which has had a good reception.

The Imperial Institute of Entomology

26. The Director's Report is printed as Appendix II. This is the last report which will be written by Dr. S. A. Neave as he retired on 31st July, 1946. Dr. Neave's name will always be honourably associated with that of the Institute. In 1909–10 he was one of the two young entomologists sent to Tropical Africa by the Entomological Research Committee (Tropical Africa), the forerunner of the Institute. On the formation of the Institute (or as it was then termed, Bureau) he soon took charge of the Information and Publications side of its work and made that his special task. Entomologists throughout the world owe to him more than to anyone else that continued orderly presentation of scientific entomological information which many have testified as being indispensable and more have come to regard as the natural adjunct for their work. It is not only the monthly issues of the two series (A and B) of the Review of Applied Entomology for which he has been responsible, but for the annual issue of the Zoological Record (Insecta) and during the war he brought out the last volumes of the standard Zoologicus Nomenclator. Apart from his wider interests in entomology and zoology generally, he,

during an emergency in the later war years, has been acting (and still does) as Honorary Secretary of the Zoological Gardens, London. The publications just set out, extending unbroken over 30 years, by their continuity and high standard hold a permanent place in the work of every Entomological Department in the British Commonwealth and of those in many foreign countries also. An extract from a paper which was published in the middle of the war (1942) in a leading German scientific paper is apt in this connection. The paper was entitled "Post War Aims." This extract was as follows :—

> "The long-felt need for an improvement in the German system of phytopathological abstracting will assume even greater prominence with the extension of this line of study in the post-war period. It is intolerable that we should indefinitely be dependent in this respect on the English Reviews of Applied Mycology and Entomology."

27. In the calendar year 1939, the numbers of subscribers to Series A and Series B of the Review of Applied Entomology were 664 and 475 respectively. These included many in enemy countries, Germany, Japan and Italy, as well as many in occupied countries. By 1942 the numbers had fallen to 447 and 381 ; thereafter they began to recover. In 1945 they were 624 and 562 respectively. The number of subscribers to the Bulletin of Entomological Research followed a similar pattern, 407 in 1939, fell in 1942 to 297 (the lowest figure in the war) and had in 1945 recovered to 407. As subscriptions from enemy countries and from most in occupied countries had not yet been renewed this recovery in numbers means mainly new subscribers and recoveries in Empire and Allied countries.

28. The number of specimens received for identification, which in the years immediately preceding the war had numbered 70,000 to 80,000, had fallen by 1942 to 10,229. Since that year it had been recovering and in the year under review (1945–46) numbered 42,912 as compared with 32,188 in the preceding year. In judging these figures of receipts it must always be borne in mind that they are the gross totals of the specimens received. They are not so many single different insects. They contain many, and on receipt an unknown number of, duplicates. This is unavoidable and, in fact, is advisable for accurate identification. An interesting point is that whereas the 85,460 specimens received in 1938–39 were sent by 193 different entomologists, the 42,912 received in 1945–46 were sent in by 199.

301 lists of identifications comprising 4,259 names (in the previous year 246 comprising 2,844 names) were sent out.

Following customary practice many named specimens were handed over to the British Museum for its collection, *viz.*, 3,817, of which 85 were type specimens new to science and 173 were named species not previously represented in the collection. These figures bring to 699,006 the number of insects presented to the Museum by the Institute during its existence, of which 7,260 are type specimens new to science and 13,112 were species not in the Museum collection.

In addition to these, the Institute also sent in the year 1,081 named specimens to the Royal Army Medical College, London ; Massachusetts State College ; and the Swiss Tropical Institute, Basle.

In order to help war-damaged libraries in Europe, surplus copies of publications in the library were sent to the Inter-Allied Book Centre. Much outside use was made of the library during the year.

Imperial Parasite Service

29. The shipments of parasites to Empire countries in each of the last ten years are as follows :—

Financial year	No. of shipments	No. of insects shipped
1936–37	182	22,338,360
1937–38	100	4,557,046
1938–39	110	485,640
1939–40	82	689,977
1940–41	8	2,021
1941–42	69	739,242
1942–43	64	326,913
1943–44	59	91,496
1944–45	145	262,969
1945–46	245 (incomplete)	816,281 (incomplete)

Dr. Thompson reports that the figures for 1945–46 are incomplete as they do not include some "large numbers of shipments made to Australia and not fully tabulated" when he made his report. The shipments in 1936–37 were phenomenal. 1940–41 was the year in which France was overran. This work in Europe ceased and Dr. Thompson was transferred to Canada, where this work was again built up. It has reached, and in fact passed, pre-war standards, for the number of insects shipped, though interesting, is not such a good guide to the general service as the number of shipments made, the numbers of varieties des-

patched and the number of countries served. In all these last there was a steady increase in 1944–45 and 1945–46.

30. The staff and its distribution remained very much as it was in 1944–45. Mr. Sellers was mostly working from Riverside, California; Dr. Lloyd was in Argentina in charge of a miscellaneous group of problems and Mr. Simmonds was for the most part working from Belleville, Canada. During the year proposals were made for stationing him in the West Indies to work primarily on a project required by Mauritius. He should, in such a centre, be able also to serve some of the needs of other tropical parts of the Empire.

31. Only one Part (Part VI of Section I) of the Parasite Catalogue appeared during the year. Dr. Thompson ascribes this partly to shortage of paper and partly to shortage of staff. The Catalogue started well in 1943 and 1944 and was well received. It is a big undertaking, involving much work. It is hoped that subsequent Parts will appear much more frequently than they have done in 1945 and 1946.

Imperial Mycological Institute

32. The Director's Report is published as Appendix III. The picture it gives is similar in outline to that set out in the beginning of this report as the general experience; increased work hampered by shortages in staff, delays in printing and general difficulties in getting things completed. Apart from these concomitants of the war, the striking thing about this report, as compared with one of, say, ten years ago, is not merely an increase in the support of the journal, the Review of Applied Mycology, but the steady development of all the services in forms which have commanded approval. This is primarily due to the patient care and watchful imagination of the Director, Dr. S. P. Wiltshire, backed up by his scientific staff.

33. These developments in the intelligence services have been noted in the Annual Reports of the Council as they were introduced, but they are worth setting out. Those issued regularly are :—

Supplements to the Review (first issue July, 1941)—listing new species of fungi described since 1st January, 1940. By December, 1945, circulation had reached 124.

Maps showing world distribution of plant diseases (first issue March, 1942). 96 maps had been issued by the end of 1945, and subscribers numbered 215.

Annotated Bibliography of Medical Mycology (first issue in 1944, covering the literature of 1943). This is prepared in conjunction with the Bureau of Hygiene and Tropical Medicine and is meeting the needs of medical mycologists.

In addition to these periodical additions, the occasional publications have been put on a regular basis under the title Mycological Papers. Whereas up to the beginning of the war these numbered 4, comprising in all about 150 pages, they now number 16, with a wider range. A grant of £200 made in 1945–46 by the Royal Society to aid the printing in this Series of a monograph by Mr. Hansford was much appreciated. Also, during the war publications have been prepared by Dr. Bisby and Dr. Ainsworth.

Progress had also been made by the end of 1945–46 in preparing and scrutinizing the lists of common names of Virus Diseases as used in the Review of Applied Mycology; also, in a preliminary examination of papers dealing with the production of antibiotics.

These developments, all of which have been worked out during the war years, are not extensions of the scope of the Institute, but are carefully thought out means for making the information it has and receives more generally available in forms convenient and acceptable for their special purpose. That is the duty of a live centre of information.

34. The increase in receipts from sales, noted in paragraph 20, is in part due to this greater range of publications. It is also due to larger sales of back numbers of the Review, of which the stocks of the earlier issues are unfortunately becoming exhausted. But the increase was by no means solely due to these causes. In 1942–43 the number of subscribers to the Review of Applied Mycology had fallen to 480; in 1945–46 the number was 724, the highest to date in the history of the Institute.

35. Mr. Mason and Major Dade continued their work (research into certain fungi) but the chief feature in the year was a substantial increase in the number of specimens and cultures of fungi received for identification and, which is more important, the number of countries from which they came. In this connection Dr. Wiltshire's acknowledgments of the assistance received in identifications from experts in the United Kingdom, Canada and the United States are fully endorsed by the Council. Neither in Entomology nor Mycology can any one centre expect to be able to identify every specimen which may be sent to it. Each should be sufficiently staffed with experts to do its share, but full service demands mutual assistance.

Finance

36. The Comptroller and Auditor-General has audited and certified the Accounts of the Institutes and Bureaux 1945–46, and those of the Imperial Parasite Service for 1944–45. These accounts form portions of this report and copies are attached to it.

37. Except for a sum of £28 18s. 5d. which had been taken by British North Borneo as part of the contribution due to the bureaux from the Colonial Empire, all arrears of contributions outstanding on the 31st March, 1945, were paid during 1945–46. The position on 31st March, 1946, was as follows :—

	Normal contributions due in 1945–46	Outstanding on 31.3.45, para. 2 of Report 1944–45	Total due	Received in advance in 1944–45 for 1945–46	Deficit Outstanding on 31.3.46	Total received in 1945–46
	£	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Imperial Institute of Entomology ..	13,442	1,146 14 9	14,588 14 9	1,550 0 0	1,960 0 0	11,078 14 9
Imperial Mycological Institute	7,900	704 14 9	8,604 14 9	950 0 0	1,035 0 0	6,619 14 9
The Bureaux ..	44,000	1,042 0 11	45,042 0 11	893 5 7	894 12 11	43,254 2 5

The figures in the last column agree with those in the Auditor-General's statements. Of the arrears outstanding on the 31st March, 1946, all have since been paid except £74 16s. 10d. on account of the Bureaux. This is made up of £28 18s. 5d. expected from British North Borneo for 1944–45, just referred to above, and £45 18s. 5d. allotted to the same country for 1945–46.

38. The Audited Statement for the Imperial Parasite Service attached to this report relates to the year 1944–45. The position as regards contributions from governments was as follows :—

	£ s. d.
Normal amount due in the year ..	5,075 0 0
Deduct amount paid in advance in 1943–44 for 1944–45—*vide* para. 17, report 1943–44	33 4 5
	5,041 15 7
Add outstanding 31st March, 1944 *vide* ditto	4 15 4
Amount expected in the year ..	5,046 10 11
Deduct amount outstanding on 31st March, 1945	74 19 1
	4,971 11 10
Add amount received in 1944–45 in advance for 1945–46	35 19 5
Contributions received in the year	£5,007 11 3

This exceeds by £29 9s. 3d. the figure shewn in the Auditor-General's statement, *viz.*, £4,978 2s. 0d. This sum of £29 9s. 3d. is made up of payments from Gambia, Sierra Leone and Tanganyika which had been received in the office but not cleared at the Bank on the close of the year. They will appear in the audited accounts for 1945–46. Of the total outstanding on the 31st March, 1945, *viz.*, £74 19s. 1d., all was received in 1945–46 except £2 1s. 7d. from British North Borneo.

The accounts for 1945–46 have not yet been audited, but by the end of that financial year the above arrears had been cleared; all payments due in the year had been received except for £4 3s. 2d., being contributions of £2 1s. 7d. expected from British North Borneo for each of the years 1944–45 and 1945–46.

39. The report for the year 1944–45 recorded costs still rising on account of the war. Expenditure in the Bureaux exceeded receipts by £6,572 8s. 2d. and balances on 31st March, 1945, were down to £4,086 16s. 11d. That was an impossible position. Governments had already been advised and all increased their contributions with effect from 1st April, 1945, pending the assembly of a Review Conference. But for this action the closure of several of the bureaux could not have been avoided. The estimate for that increased provision had been based on conditions as they were in the spring of 1944, but costs continued to rise rapidly throughout 1945–46, *e.g.*, the extension and increase in war bonuses announced in November, 1945. Gross expenditure at £47,196 was £6,814 or 14·4 per cent. above that in the previous year, but was fully covered by the increased contributions and the rise of £2,199 in receipts from sales. The year therefore closed with some improvement in the cash balances. It must be remembered that the Accounts presented with these reports are statements of receipts and outgoings in the year. Many subscriptions to journals are received in the first three months of the year, and therefore appear as receipts. Balances on 31st March each

year, therefore, always include a certain number of advance payments, which increase in total amount as the subscribers to the journals increase in numbers.

40. Similar causes affected expenditure in the Institutes. In the Mycological Institute gross expenditure in 1945–46 at £10,064 was 15 per cent. higher than in the previous year, an increase very similar to that in the Bureaux. In the Institute of Entomology, where two senior officers on the Institute's pay roll, Mr. Bryant and Dr. Cameron, had retired at the end of the previous year, it was £18,502 or 7 per cent. The accounts of the Institute of Entomology for the year were also assisted by a recovery of £680 on account of F.S.S.U. payments made for an officer, Dr. Ferriere, who had been given indefinite leave of absence in 1940 and on the close of the war had decided not to return. Though receipts from sales rose by £550 and £1,203 respectively, gross receipts in the year did not meet gross expenditure at either Institute. Balances had to be drawn upon. The Institutes had come through the war without any increase in contributions above those for 1937, but with costs still rising, work expanding, and deficits in both cases, the need for reconsideration of their financial position was apparent. This was one of the tasks of the Review Conference of 1946.

Empire Potato Collection (or South American Potatoes)

41. Appendix IV is the report on the work in the calendar year 1946. Work followed similar lines to those in previous years, pending consideration of the future arrangements by the Review Conference. Changes in staff were few. Dr. M. A. Keay joined as Mycologist on 1st June, 1946. Dr. Pushkar Nath, Ph.D., Superintendent of the Plant Breeding Station, Simla, had been deputed by the Government of India to work on the collection for six months to become thoroughly familiar with it, with the preliminary work being done upon it and with those engaged thereon. He arrived in April, 1946. He was very welcome. Direct associations of this nature with those, who in overseas countries are or will be working on potatoes and handling this material later, are very helpful.

42. Besides the Review Conference, the chief event of the year was the virtual completion of the new buildings provided by the Nuffield Foundation (see reports of 1942–43 to 1944–45). The greenhouses were available for the full year's work. The laboratory block was occupied in April. For the first time work was conducted under proper control. The effect has immediately been apparent, even in this first year. More important still, these conditions enabled the Review Conference to plan in broad outline the work over the next five years. The report of that Conference sets out the lines that work is to follow. The Conference recorded its special thanks to the Nuffield Foundation for their generous help.

43. Additional varieties received during the year, numbered 698, including 245 varieties of experimental material brought by Dr. Hudson from Germany. The Collection, by its existence and by the work in progress, continues to attract gifts of fresh material so that with the work in progress the new accommodation is already strained.

44. With constant new accessions to the Collection, work continued on the systematics and chromosome counts. It is hoped to have ready by 1948 a full Taxonomic Monograph on the Collection. With the new accommodation work on testing for virus infection and immunity can be pursued with confidence. Over 1,300 samples were tested by sap inoculation or in some cases by grafting. The help given by Dr. G. Samuel of the Plant Pathological Laboratory, Harpenden and by Dr. Ellenby of King's College, Newcastle-on-Tyne in testing for susceptibility to wart disease and eelworm attack, respectively, is much appreciated. 294 varieties (759 tubers and 9 samples of seed) were despatched in the year to Empire countries overseas and 53 varieties (148 tubers and 43 seed samples) to foreign countries, *viz.*, France, Argentina, U.S.S.R., Poland and Czechoslovakia.

All contributions from governments due up to 31st March, 1946, have been paid.

Research Schemes

45. Two Governments, New Zealand and Southern Rhodesia, contribute to the Low Temperature Research conducted under the Department of Scientific and Industrial Research. Sums due in the year, namely £500 and £50 respectively, were received and paid over to the Department within the year.

Three Governments, Australia, New Zealand and the Union of South Africa, contribute through the Executive Council to the Wool Industries Research Association, towards the work done at Torridon, Leeds. These sums, namely, £1,000, £50 and £400, due in the year were received and paid to the Association.

J. G. ROBERTSON,
LT.-COL.
Chairman.

THE EXECUTIVE COUNCIL OF THE IMPERIAL AGRICULTURAL BUREAUX

Account of Receipts and Payments for the year ending 31st March, 1946

RECEIPTS.

	£ s. d.	£ s. d.	£ s. d.
*Balance on 1st April, 1945 ..			8,954 8 2
Contributions from Governments of the Empire and Sudan :—			
Imperial Agricultural Bureaux ..	43,254 2 5		
Various Institutes	13,206 14 9		
		56,460 17 2	
Less : Paid over		13,236 4 0	
			43,224 13 2
Journal of Dairy Research ..			109 6 1
Potato Expedition Fund ..			4,127 7 6
Contribution by Institutes towards cost of Headquarters			375 0 0
Miscellaneous Receipts :—			
Interest and Dividends ..	231 11 4		
Translation Fees	57 9 11		
			289 1 3
			£57,079 16 2

*This includes sums held on behalf of :—

Potato Expedition Fund ..	£6,789 6 7
Journal of Dairy Research ..	18 8 8

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) G. C. UPCOTT,
Comptroller and Auditor-General.

PAYMENTS.

	Expenditure £ s. d.	Less Receipts for Sale of Publications, etc. £ s. d.	Net Expenditure £ s. d.
Expenditure incurred by the Imperial Bureau of :—			
Soil Science (Rothamsted) ..	3,128 3 7	660 18 5	2,467 5 2
Animal Health (Weybridge) ..	7,229 19 10	2,291 8 3	4,938 11 7
Animal Nutrition (Aberdeen) ..	4,160 4 9	130 13 10	4,029 10 11
Animal Breeding and Genetics (Edinburgh)	4,135 3 10	874 5 3	3,260 18 7
Pastures and Forage Crops (Aberystwyth)	7,690 6 6	1,032 8 0	6,657 18 6
Plant Breeding and Genetics (Cambridge)	5,230 3 9	686 1 7	4,544 2 2
Horticulture and Plantation Crops (East Malling)	3,251 11 8	886 9 0	2,365 2 8
Agricultural Parasitology (St. Albans)	1,607 1 9	317 15 2	1,289 6 7
Dairy Science (Shinfield)	3,038 14 10	636 8 8	2,402 6 2
Forestry (Oxford)	4,211 14 4	443 15 11	3,767 18 5
Secretariat	3,513 1 2	11 2 8	3,501 18 6
	47,196 6 0	7,971 6 9	39,224 19 3
Potato Expedition Fund ..			3,852 3 0
Balance on 31st March, 1946.			
H.M. Paymaster General ..	13,735 0 3		
Less : Outstanding Orders ..	2,578 8 9	11,156 11 6	
Add : Sub-Accountants and Deposit Accounts ..		208 0 3	
Post Office Savings Bank		2,638 2 2	14,002 13 11*
			£57,079 16 2

Investments at 31st March, 1946.

£2,000 4% Commonwealth of Australia Registered Stock 1955/70 at cost	£1,940 4 0

*Includes sums held on behalf of :—

Potato Expedition Fund ..	£7,064 11 1
Journal of Dairy Research ..	127 14 9

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) DAVID CHADWICK,
Secretary.
Executive Council, Imperial Agricultural Bureaux.
9th July, 1946.

IMPERIAL INSTITUTE OF ENTOMOLOGY

ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1946

RECEIPTS.

	£ s. d.	£ s. d.
Balance on 1st April, 1945		11,213 19 10
Contributions from :—		
Empire Governments ..	11,078 14 9	
Foreign Governments ..	375 0 0	
Societies	100 0 0	
		11,553 14 9
Interest and Dividends ..		555 3 7
Sales of Publications ..		4,017 18 10
		£27,340 17 0

PAYMENTS.

	£ s. d.	£ s. d.
Salaries, Directors		2,555 0 0
F.S.S.U. contributions		246 0 0
Salaries, Scientific Staff		7,725 7 7
F.S.S.U. contributions		180 12 5
Salaries, Librarian, Clerical Staff, etc.		2,812 10 9
F.S.S.U. contributions		284 13 0
Part time work		24 3 4
National Insurance		39 2 6
Travelling Expenses		494 17 11
Library : Books, Publications, Binding, etc.		107 8 7
Bulletins		2,338 3 11
Stationery, Postages, Telephones, etc.		96 13 7
Rent, Rates, Insurance		366 3 0
Housekeeping, Light, Heat, Water, Cleaning, etc.		261 2 2
Laboratory Equipment		49 2 2
Contingencies		1 8 0
Audit Fee and Contribution towards Headquarters		250 0 0
		17,832 8 11
Balance on 31st March, 1946.	£ s. d.	
Joint Colonial Fund	9,000 0 0	
Crown Agents for the Colonies	296 0 4	
Dr. S. A. Neave	36 10 3	
	9,332 10 7	
Add : F.S.S.U. Suspense	176 19 5	
	9,509 10 0	
Less : Amount in suspense	1 1 11	9,508 8 1
		£27,340 17 0

Investments on 31st March, 1946.

			£ s. d.
£1,040 5 2	Queensland	1922/47 Stock 3% at cost	1,000 0 0
£1,000 0 0	Cyprus	1956/66 ,, 4% ,,	950 0 0
£2,679 19 0	Funding	1960/90 ,, 4% ,,	1,869 12 6
£1,000 0 0	Jamaica	1952/62 ,, 4% ,,	940 0 0
£1,017 16 8	Kenya	1961/71 ,, 4½% ,,	998 15 0
£1,000 0 0	India	1950/55 ,, 4½% ,,	936 7 0
£1,000 0 0	Nigeria	1963 ,, 4% ,,	881 7 0
£8,738 0 10			£7,566 1 6

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) S. A. NEAVE,
Director.

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) G. C. UPCOTT,
Comptroller and Auditor-General.

(Signed) DAVID CHADWICK,
Secretary, Executive Council of the Imperial Agricultural Bureaux. 14.6.46.

IMPERIAL INSTITUTE OF ENTOMOLOGY (PARASITE LABORATORY)

ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1945.

RECEIPTS.

	Canada	United Kingdom	Total
	$	£ s. d.	£ s. d.
Balance on 1st April, 1944	10,500.26	2,349 1 1	1,979 14 10	4,328 15 11
Contributions from Governments of the Empire	5,587.50	1,250 0 0	3,728 2 0	4,978 2 0
Contributions for Special Projects	16,733.84	3,743 11 9	359 16 5	4,103 8 2
Rent of Farnham House			419 10 0	419 10 0
Sales of Publications	727.93	162 16 11	96 7 11	259 4 10
Interest—				
General Account			7 12 4	7 12 4
Capital Account			3 12 4	3 12 4
Contribution from the Imperial Economic Committee for storage space at Farnham House			10 0 0	10 0 0
Remittances from the United Kingdom	*21,042.50	4,750 0 0		4,750 0 0
Refund of balance of imprest			8 10 9	8 10 9
Suspense Account, 1943/44 adjustment	4.48	1 0 0		1 0 0

* Excludes £700 in transit.

PAYMENTS.

	Canada	United Kingdom	Total
	$	£ s. d.	£ s. d.	£ s. d.
Directional Staff :—				
Superintendent	5,815.80	1,301 1 6	60 0 0	1,361 1 6
Superannuation	231.25	51 14 8	71 15 1	123 9 9
Scientific and Technical :—				
Assistant Entomologists	9,496.29	2,124 9 0	132 11 5	2,257 0 5
Superannuation			170 10 0	170 10 0
Clerical Staff	3,767.10	842 15 1	28 17 2	871 12 3
Laboratory Stewards	4,882.57	1,092 5 11	84 13 5	1,176 19 4
Superannuation			78 10 5	78 10 5
House Maintenance			3 3 0	3 3 0
Laboratory Maintenance	2,357.54	527 8 3	33 1 3	560 9 6
Rates			11 12 10	11 12 10
Fire and other Insurances			79 2 6	79 2 6
Travelling Expenses	9,103.51	2,036 11 8	39 0 0	2,075 11 8
Freight and Postages	1,275.60	285 7 4		285 7 4
Library	76.50	17 2 3		17 2 3
Audit Fee			10 0 0	10 0 0
Publications	959.83	214 14 6		214 14 6
Less by exchange		42 10 1		42 10 1
	37,965.99	8,536 0 3	802 17 1	9,338 17 4
Remittances to Canada			5,450 0 0	5,450 0 0
Refund of balance of imprest	38.16	8 10 9		8 10 9
Suspense Account, 1943/44 adjustment			1 0 0	1 0 0
Balances on 31st March, 1945, United Kingdom :—				
Joint Colonial Fund			1,000 0 0	
Crown Agents for the Colonies—				
Capital Account			183 1 2	
F.S.S.U. Suspense			59 18 3	
			1,242 19 5	
Less : Amount due to Crown Agents for the Colonies—				
General Account			883 9 11	
			359 9 6	359 9 6
Canada :				
Sundry Imprests	4,712.23			
Treasury	11,880.13			
	16,592.36	3,711 18 9		3,711 18 9
	$54,596.51	£12,256 9 9	£6,613 6 7	£18,869 16 4

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) DAVID CHADWICK,
Secretary, Executive Council, Imperial Agricultural Bureaux. 29.5.46.

I have examined the above account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) G. C. UPCOTT,
Comptroller and Auditor-General.

IMPERIAL MYCOLOGICAL INSTITUTE, KEW, SURREY

ACCOUNT OF RECEIPTS AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH, 1946

RECEIPTS.

	£	s.	d.
Balance on 1st April, 1945	9,946	12	1
Contributions:			
Empire Governments	6,619	14	9
Sudan	125	0	0
Dividends and Interest	241	1	1
Publications	2,166	3	8
Grant from the Royal Society towards Mr. Hansford's 'Foliicolous Ascomycetes'	200	0	0
Grant from the Bureau of Hygiene towards publication of 'Bibliography of Medical Mycology'	15	0	0
Grant from the Ministry of Supply	50	0	0
	£19,363	11	7

PAYMENTS.

	£	s.	d.
Director's Salary	1,280	0	0
Superannuation	126	0	0
Scientific and Technical Staff Salaries	4,695	5	6
Superannuation	405	16	2
Clerical Staff Salaries	885	0	7
Superannuation	80	18	0
Laboratory Attendant	299	13	6
Superannuation	26	16	0
Part-time and Overtime	49	12	5
National Insurances	29	3	6
Travelling	10	15	9
Library	23	7	1
Publications	1,501	4	6
Postage, Stationery, Telephone, etc.	88	4	8
Rent, Rates and Insurance	121	7	4
Light, Heat, Water, Cleaning	256	17	0
Laboratory Apparatus	43	12	5
Contingencies	1	17	11
Contribution to Headquarters and Audit	120	0	0
Furniture	17	18	2
	10,063	10	6

Balance on 31st March, 1946.	£	s.	d.	£	s.	d.
Joint Colonial Fund	7,500	0	0			
Crown Agents for the Colonies	411	12	6			
Bank	1,264	1	7			
Petty Cash	2	2	9			
Stamps	13	4	0			
F.S.S.U. Suspense Account	110	16	3			
	9,301	17	1			
Less: Income Tax Suspense	1	16	0			
	9,300	1	1	9,300	1	1
				£19,363	11	7

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) G. C. UPCOTT,
Comptroller and Auditor-General.
(Signed) E. J. ALLIES,
Accountant to Council.

Investment at 31st March, 1946.

£2,077 15s. 4d. New Zealand 3½% 1960/64.

(Signed) S. P. WILTSHIRE,
Director.

(Signed) DAVID CHADWICK,
Secretary.

Executive Council of the Imperial Agricultural Bureaux.
19.6.46.

APPENDIX I

Extract from Food and Agriculture Organization Bulletin, Vol. No. 4, being part of the report prepared by an Informal Meeting of Experts on Statistical, Scientific and Technical Information assembled by Food and Agriculture Organization in London, 10th–13th April, 1946.

" Publication Services

Abstracting

The sub-committee took it for granted that F.A.O. does not expect to duplicate the work of existing organizations by itself engaging in abstracting work, but that it might help to develop the work of existing agencies and to co-ordinate their services. The point was made that if F.A.O. were not itself doing the abstracting, it would be in a better position to criticize the work being done. It will be welcome to use the existing machinery of the Imperial Agricultural Bureaux (an offer previously made also by Chemical Abstracts and by Chronica Botanica in the United States of America).

F.A.O. should have an advisory committee to keep abstracting work under review, prepare descriptive lists of abstracting journals, and advise the Organization on needed services. This committee should consider the difficult problem of translation of abstracts and make recommendations thereon.

Relationships should be worked out between F.A.O. and U.N.E.S.C.O., which will also be concerned with scientific abstracting.

Reviewing

The sub-committee emphasized that there is need for more reviewing than is now being done and agreed that, in contrast to abstracting, this is a field in which F.A.O. might engage directly. It would be impossible for F.A.O. to maintain a large enough staff of experts to prepare adequate reviews in its various fields of interest, but it should seek the most competent person in each particular case and assign the work to him or her. To avoid duplication and help in determining needs, abstracting and other agencies should keep F.A.O. informed of reviews they have in preparation.

Two types of reviews were distinguished by the sub-committee : (*a*) those of current interest to fulfil a reader demand for information on a subject in which there have been important or interesting developments, and (*b*) systematic reviews of various fields of science over such periods as are required. In its own work, F.A.O. might perhaps especially emphasize the former.

The question of urgent present needs was discussed without any very definite conclusions except that (*a*) scientific progress in the control of waste of food (by insects, etc.) between harvest and consumption should be summarized promptly, and (*b*) countries starved of knowledge of scientific progress during the war need to be brought up to date as soon as possible. The sub-committee felt that the forthcoming United States Department of Agriculture Yearbook would be especially useful for the latter purpose, and asked that urgent representations be made to the Secretary of Agriculture for the publication of this volume at the earliest practicable date, and for arrangements to give the material the widest possible international distribution. (A letter to this effect, addressed to Secretary of Agriculture Clinton P. Anderson, was approved at the final plenary session and signed by the Chairman, Professor Mayer).

It was suggested that the yearbook might be considered as the beginning of a periodic reviewing of scientific developments in all countries, perhaps through an international scientific congress.

Exchange of Information on Research

The sub-committee was in agreement that F.A.O. should collect information on the administrative organization of research in the different countries and undertake to obtain and publish a list or directory of research institutions, throughout the world, the principal lines of work at each institution, and the leading research workers involved. This list should be kept current. The best approach might be by questionnaire through National Committees of F.A.O. and close liaison with leading research institutions. Such a directory would have many uses and would serve as the beginning of a roster of scientific personnel for F.A.O. missions and other work.

It was not considered feasible for F.A.O. to attempt to be kept currently advised of all research projects because of the vast amount of detail involved and the many and constant changes that take place in such projects.

Through national committees, F.A.O. might also compile an annotated list of *bona fide* scientific societies in each country.

F.A.O. could not undertake to prepare and publish lists of research workers in each country, but it should encourage countries to publish their own lists, and it might compile a directory of such lists.

F.A.O. Publications

In determining which of the I.I.A. (International Institute of Agriculture, Rome) publications should be maintained and developed, F.A.O. should keep in mind the desirability of ensuring continuity in regular series and at the same time giving the publications greater practical value.

In considering a suggestion that F.A.O. prepare multilingual dictionaries of scientific terms, the sub-committee agreed that such a project might prove impracticable. It was suggested, however, that F.A.O. might make a start in that direction by preparing a list of important technical terms in English and French, to be circulated so the equivalents in other languages might be added.

The sub-committee agreed that F.A.O. should publish tables of equivalents of the metric system, first, however, investigating the existence and adequacy of other publications containing such tables."

APPENDIX II

IMPERIAL INSTITUTE OF ENTOMOLOGY
DIRECTOR'S REPORT FOR 1945–46

Partly due to shortage of staff and partly to the scattered nature of the accommodation in which the staff of the Institute has to work, the year was one of considerable administrative difficulty, yet it marked a gratifying increase in all activities. The number of insects sent in for identification was much the largest for six years and the demand for publications was much the greatest in the history of the Institute. Calls on the general information services were at least as great as usual, and assistance was given to many Government Departments, as well as to individual entomologists, both in the United Kingdom and overseas. The Institute assisted in caring for some Scoliid parasites en route through England to Samoa. For this the Institute received a special letter of thanks from the Government of New Zealand.

Staff

Changes in staff in the year were few. Mr. R. J. Collins was engaged in May, 1945, on a part-time basis to aid in the identification of Lepidoptora. By arrangement with the Government of India, Mr. A. P. Kapur, an Assistant Entomologist in the Agricultural Department, Kashmir, has been seconded to the Institute for a period of three years. He took up his duties in April, 1945. In addition to acquiring a general knowledge of the working of the Institute, he is specializing in Coccinellid beetles and assisting in their identification.

Though additions to the staff of abstractors were urgently needed, suitable candidates could not be found, largely because few at all qualified were demobilized from the Services.

As this is the last report that I shall write, I should like to take this opportunity to place on record my high appreciation of the loyalty and devotion to duty shown by the whole staff, more especially during the difficult and often dangerous conditions that obtained during the last few years. The Institute's offices, though fortunately not seriously damaged, were in one of the lines of flight of the flying bombs, no less than 5 of which fell within a few hundred yards of them.

Identification of Insects

During the year under review the number of specimens received amounted to 42,912, as compared with 32,188 in the previous year. These insects were sent in by 199 (145) different correspondents, who were geographically distributed as follows :— Africa 39 (29), America 13 (12), Asia 20 (15), Oceania 13 (6), Europe 114 (83), all the numbers in brackets being those for the previous year.

The lists of identifications sent out totalled 301 (246), comprising 4,259 (2,844) names. The actual numbers of identifications sent to the various Dominions, Colonies and other territories are as follows :—

AFRICA :				
Union of South Africa	..	69	(98)	
Southern Rhodesia	..	14	(12)	
Sudan	..	153	(17)	
Gold Coast ..	..	189	(98)	
Kenya	..	420	(393)	
Nigeria	..	105	(57)	
Nyasaland ..	..	18	(53)	
Sierra Leone ..	..	207	(70)	
Tanganyika Territory	..	17	(54)	
Uganda	..	520	(345)	
Other Territories..	..	432	(501)	
				2,144 (1,698)
AMERICA :				
West Indies ..	..	55	(30)	
Other Territories..	..	215	(63)	
				270 (93)
ASIA :				
India and Burma	..	125	(82)	
Ceylon	..	18	(–)	
Palestine ..	..	456	(37)	
Other Territories..	..	159	(328)	
				758 (447)
OCEANIA :				
Australia and New Guinea		10	(4)	
New Zealand ..	..	179	(2)	
Fiji Islands ..	..	319	(257)	
Solomon Islands	..	43	(–)	
Other Islands ..	..	22	(–)	
				573 (263)
EUROPE :				
United Kingdom..	..	494	(338)	
Other Countries	..	20	(5)	
				514 (343)

In addition to the named specimens which are returned to the senders, 3,817 (1,666) insects have been handed over to the British Museum, of which 85 (37) were types of species new to science, and among the remainder 173 (214) were named species not previously represented in the National Collection. These figures do not, however, represent the whole of the work done, since many insects have not yet been handed over to the National Collection, owing to the fact that the groups to which they belong had not then been brought back from evacuation to safer parts of the country.

Some 1,081 named specimens were also presented to the Royal Army Medical College, London; Massachusetts State College, U.S. America; and the Swiss tropical Institute, Basle.

During the year, 10 papers (279 pages) on insect taxonomy have been published by 5 members of the staff.

Publications

The production of the Institute's publications was attended by even greater difficulties than in the previous year. These arose not only from the impracticability of recruiting badly needed additional staff, but the difficulty of getting even routine printing done at all punctually was greater than at any time during the war years. Consequently it was found impossible to keep either the matter or the appearance of the individual parts as much up-to-date as was the case in the years before the war. These are, however, only temporary difficulties and should gradually disappear with more settled conditions.

Subscriptions and sales for 1945 exceeded all expectations. Subscriptions showed a marked increase and sales of back numbers rose steeply. The main reason for this is that institutions and subscribers in countries occupied during the war have purchased the necessary volumes to bring their sets up-to-date.

The total net cash receipts for all journals during the financial year 1945–46 amounted to £4,017 18s. 10d., against £2,811 0s. 3d. for 1944–45. They exceeded the previous income from publications in any year by well over £1,000.

"Review of Applied Entomology"

The 33rd (1945) volumes of the two series of the "Review of Applied Entomology" comprised 610 pages,

as against 672 (1944), and 1,434 abstracts and titles, against 1,597 (1944).

Subscriptions to Series " A " increased from 516 (1944) to 624 (1945) and for Series " B " from 482 (1944) to 562 (1945).

Sales of back numbers rose from £479 17s. 3d. (1944) to £1,041 17s. 6d. (1945).

Total cash receipts for the " Review " during the calendar year 1945 amounted to £2,107 0s. 8d., against £1,588 6s. 10d. for 1944.

" Bulletin of Entomological Research "

The 36th volume (1945) of this journal contained 512 pages, against 416 in the previous volume. It comprised 34 papers and was illustrated by numerous text figures and eighteen plates.

The number of subscribers rose from 353 (1944) to 407 (1945).

Sales of back numbers amounted to £533 15s. 9d., against £309 19s. 0d. in 1944.

Reprints realized £105 6s. 6d., against £77 7s. 7d. in 1944.

Total cash receipts for the calendar year 1945 amounted to £1,067 6s. 8d., against £982 6s. 3d. for 1944.

" Zoological Record," part " Insecta," Vol. 81 (1944)

As, owing to printing difficulties, this volume was not issued until February, 1946, the bulk of sales relating to it will appear in the 1946 accounts.

Sales of back volumes amounted to £124 9s. 0d., as against £118 12s. 10d. for 1944.

The net profit to the Institute for the calendar year 1945 was £86 5s. 7d., as against £82 14s. 9d. for 1944.

The annual contribution of £100 to the Institute was received from the Zoological Society of London towards the cost of preparation.

Other Publications

" A Review of the Literature on Soil Insecticides ", by Dr. H. C. Gough, was published by the Institute during the year at the request of the Agricultural Research Council and has had a ready sale.

The net cash received for this and other separate publications amounted to £61 10s. 5d., as compared with £48 8s. 1d. in the previous year.

Library

Accessions during the year numbered 67 (102) bound volumes and 1,067 (684) pamphlets, making a total of 11,182 volumes and 31,473 pamphlets. Parts of 401 (385) serial publications were received. Exchanges with European countries are gradually being re-established, and to help war-damaged libraries, surplus publications received by the library are being sent to the Inter-Allied Book Centre.

The catalogue of serial and official publications was kept up to date, and the author catalogue is up to date for monographs and separates. Arrears in cataloguing amount to 2,872 volumes, an increase on last year's figures. Pressure of work has been so great that the cataloguing of current works only has been possible. It is hoped to make up these arrears when the library staff has been increased.

The classified subject index to monographs now numbers over 1,400 cards.

There have been numerous visitors to the library, including scientists from many parts of the Empire, and also from foreign countries. Loans to outside institutions have decreased, owing to the return to London of some evacuated libraries. They nevertheless numbered 1,238, this being only slightly less than the figure for the previous year, 1,308, which was the highest on record.

Thanks are again due to the British Council for assistance in obtaining some foreign publications.

S. A. NEAVE,
Director.

APPENDIX III

IMPERIAL MYCOLOGICAL INSTITUTE
DIRECTOR'S REPORT FOR 1945-1946

The work of the Institute increased throughout the year. Following the cessation of hostilities the renewal of contacts with European countries began. Incoming literature taxed the small abstracting staff considerably, and the difficulties prevalent in the printing industry added to our troubles. The restricted accommodation at the Institute was another handicap.

Investigational Work

Supplements 11 and 12 to the *Review of Applied Mycology*, listing new species of fungi, were compiled and issued during the year. A cumulative index to Supplements 1 to 10 was issued to subscribers in mimeographed form and it is hoped to issue a printed index at the end of ten years.

Major Dade continued his studies on the genus *Aspergillus*. He has supplied cultures to three mycologists for their researches on antibiotics. A number of cultures of new species of *Aspergillus*, preserved in lyophile form in the United States, were grown and checked for the National Collection of Type Cultures. Thirteen enquiries regarding the moulding of foodstuffs were dealt with, and identifications provided for the Ministry of Food.

Mr. Mason has continued the systematic study of the Hyphomycetes, an extremely important group of plant pathogenic fungi and, with the assistance of Mr. Hughes, has studied in particular the early species of the genus *Helminthosporium* and their segregates. An account of this work is being prepared for publication.

Mr. Mason has completed the making of microscopic mounts of the British herbarium material referred to *Torula* and is preparing a revision of the genus. His study of the genus *Monilia* is held up pending an examination of the material in Persoon's herbarium. The scope of these investigations has had to be broadened to include the type species of the related genera and the investigation now comprises the whole of the Phragmosporæ.

The second edition of the Dictionary of the Fungi by Dr. Bisby and Dr. Ainsworth was published in August, 1945. The continued sale of this work, which has been well reviewed, testifies to its usefulness.

" An introduction to the taxonomy and nomenclature of fungi ", prepared by Dr. Bisby, was published in November, 1945. It has been accorded a good reception. Sales have been correspondingly gratifying.

The list of common tropical plant diseases has been completed by Dr. Bisby but the mimeographing of it has been held up through lack of staff.

A list of medical fungi compiled by the Director and Dr. Bisby has been prepared for typing. The list will be submitted to authorities in the United Kingdom and abroad with a view to achieving some standardization of the nomemclature of these difficult fungi.

Early in 1946, Dr. Bisby started to compile a list of the fungi of Ceylon. In this he has the invaluable assistance of Mr. T. Petch, formerly Mycologist to the Ceylon Department of Agriculture, whose card index of records left in the Department has been copied for the Institute. The publication is expected to be a joint one. A good start was made on this rather onerous undertaking.

Dr. Ainsworth and Miss Sampson almost completed their joint monograph on the British smuts and typing of the mss. has commenced.

Dr. Bisby published the following papers during the year :—

(1) " Longevity of Schizophyllum commune."—*Nature*, clv, pp. 732–3, 1945. [In this paper Dr. Bisby completes a further stage in an investigation started by the late Professor Buller and shows that *S. commune* is capable of living for 35 years.]

(2) " What are mycologists doing about nomenclature ? "—*Ann. appl. Biol.*, xxxii, pp. 183–4, 1945.

(3) " Stachybotrys and Memnoniella."—*Trans. Brit. mycol. Soc.*, xxviii, pp. 11–12, 1945.

(4) An obituary notice of Professor A. H. R. Buller was reprinted in *Mycologia*, xxxvii, pp. 275–277, 1945.

Mr. Hughes completed the preparation of a paper entitled " An undescribed species of Chætomium with four spored asci " which was published in the *Trans. Brit. mycol. Soc.*, xxix, p. 70, 1946.

Identification Work

Specimens and cultures of fungi have been received from Canada, South Africa, New Zealand, India, Anglo-Egyptian Sudan, Southern Rhodesia, Bermuda, New Guinea, Gold Coast, Uganda, Kenya, Sierra Leone, Nigeria, Tanganyika, Bougainville Island (Solomons), Jamaica, Mauritius, Palestine, Ceylon, Barbados, Trinidad, St. Vincent, St. Lucia, Grenada, Dominica, Tobago, and Great Britain, as well as from the United States, China, and Galapagos Island (Ecuador). Among the more important fungi received was *Phytophthora palmivora*, causing an extensive invasion of tapping bark of *Hevea* rubber in Ceylon, an unusual type of infection for this species. Species of *Aspergillus* were identified for various correspondents and for the Home Office Fire Division in connexion with spontaneous combustion following heating of palm kernels by bacterial and fungal decomposition. Three fungi attacking textiles originating from New Guinea and one from the United States proved of great mycological interest. All appear to be undescribed species, two being referred to *Monotospora Corda* and one to *Gliomastix* Guégen as those genera are treated in Mycological Papers 3 and 5.

In July, 1945, Miss Hickman undertook the duties of Herbarium Clerk on her return from the Land Army. A start has thereby been made in cataloguing and indexing the specimens in the Herbarium. All specimens received are now entered in an accessions book and numbered. Each specimen is indexed under its host plant and fungus name. Any alteration in nomenclature is noted in the accessions book. The organization thus initiated will permit for the first time easy reference to specimens in the Herbarium. Up to the end of the year 2,800 specimens were catalogued, of which 909 were received during the year. A start was also made in preparing slides of specimens in the Herbarium. Ultimately it is hoped to have slides of all specimens of microfungi but at present slides are being made of all new accessions and as many of the other specimens as can be conveniently tackled. There is no doubt that all this work will add greatly to the value of the Herbarium. It constitutes a new departure in herbarium practice in the United Kingdom.

The Institute was greatly indebted to Dr. G. B. Cummins of Purdue University, United States, Dr. W. L. Gordon of Canada, Miss Wakefield and Dr. Dennis of Kew, and Mr. G. Smith of the London School of Hygiene and Tropical Medicine for help in identifications.

Information Service

Review of Applied Mycology

Volume xxiv of the *Review* and the index to Vol. xxiii were published. Owing to difficulties in printing the *Review* was mostly late in appearing. This continued delay added to the labour of abstracting the increasing mass of incoming literature. The cost of printing and distributing amounted to £767 19s. 0d. and receipts from sales, including sales of back numbers, amounted to £1,732 15s. 11d. The number of subscribers at the end of the year was 751, an increase of 194 over the preceding year and the largest total of subscribers ever reached by the *Review*. The total circulation amounts to 1,011, including 159 free copies and 101 exchanges. The volume contained 512 pages (enlarged type page) and 1,310 abstracts (as against 512 pages and 1,200 abstracts) for the preceding year. The index to Vol. xxiii comprised 59 pages. Volumes ii, iii, iv, v, and vi became out of print during the year, so that no volumes earlier than Vol. ix are available apart from odd sets that are sometimes bought in or surplus copies occasionally returned to the Institute. The underprinting of the earlier volumes of the *Review* now entails a considerable financial loss to the Institute and sometimes means the loss of orders for complete sets.

Supplements to the Review

The circulation of this very specialized publication reached a total of 124 by the end of the year, an increase of 7. Receipts from sales amounted to £40 5s. 7d. and the cost of printing £48 18s. 6d. The mimeographed cumulative index of supplements 1–10 was issued free to all subscribers.

Distribution Maps of Plant Diseases

Maps 73 to 96 were issued during 1945, and new editions of maps 2, 3, 4, 7 and 18. The editions of many of the earlier maps were very restricted and the exhaustion of the stock has necessitated reprinting or the issue of fresh editions. The number of subscribers reached a total of 215, an increase of 9, and receipts from sales amounted to £44 11s. 4d.

Mycological Papers

Four papers were issued during the year. No. 11 by Lee Ling, " A contribution to the knowledge of the Ustilaginales in China " ; No. 12 by G. Watts Padwick, " Notes on Indian Fungi III " ; No. 13 by E. B. Martyn, " A note on banana leaf speckle in Jamaica and some associated fungi " ; No. 14 by A. S. Boughey, " A preliminary list of plant diseases in the Anglo-Egyptian Sudan." Mr. Hensford's large paper was soon through the Press but not actually published.

Receipts from sales of Mycological Papers amounted to £41 8s. 8d.

Annotated Bibliography of Medical Mycology, 1944

The bibliography for 1944 was published during the year. It consisted of 42 pp., and comprised annotations of 202 papers with an index of authors and a general index. A grant of £15 was again received from the

Honorary Committee of Management of the Bureau of Hygiene and Tropical Diseases and £18 3s. 2d. was received from sales.

Common Names of Virus Diseases used in the Review of Applied Mycology

The revised manuscript of this list was prepared for the Press with a view to issuing it as a special part of the *Review* during 1946.

Library

About 190 books and reprints were sent out on loan during the year. Accessions to the library totalled about 20 books (apart from periodicals) and 300 separates. Surplus mycological publications have been offered to visiting mycologists and other surplus papers dispatched monthly to the Imperial Agricultural Bureaux, Accessions Branch, at Aberystwyth. Binding was drastically curtailed during the war and in the year under review it was only possible to have a small number of volumes bound.

At the request of the Wellcome Research Foundation, the compilation of a bibliography of antibiotics was undertaken from January, 1946, the scope of the bibliography being restricted to papers on the production of antibiotics. This experimental list has been distributed to a number of research workers interested in the subject, many of whom find the list most welcome. The number of papers involved was not so great as expected and this preliminary survey will prove of great value should the abstracting of papers on the subject ever be undertaken. It is proposed to continue the list until the end of 1946 at least.

Staff

Mr. L. G. M. Gall joined the staff as Slavonic abstractor on 1st June, 1945.

Dr. G. C. Ainsworth resigned his post as Assistant Mycologist on 31st December, 1945, to become Head of the Mycological Department of the Wellcome Research Foundation.

S. P. WILTSHIRE,
Director.

APPENDIX IV

WORK ON THE SOUTH AMERICAN POTATO COLLECTION

CALENDAR YEAR, 1946

supplied by

DR. P. S. HUDSON

General

Progress of Scientific Work on the South American Potato Collection.

The event of the year was the virtual completion of the new buildings. The greenhouses were available for the full season's work; the laboratory block was ready for use by April. The value of the new buildings in expediting routine work has been immense, even in the first year, and in spite of staff shortages. The greenhouses proved their value by the increased yields that were obtained this year, while the spread of virus diseases through the collection was checked.

Some difficulty was experienced in finding room for over 200 lines of breeding material which were received from Germany, also about 250 lines received from Peru had to be stored until earlier ripening material had been harvested.

(1) Systematics. (Dr. Hawkes, I.A.B.) 80 lines of potatoes have been classified botanically during 1946. Some 170 dried specimens of potato plants and leaf types have been made for record purposes. Work is in progress on a Taxonomic Monograph of potato species which it is hoped will be ready for publication in 1948.

(2) Cytology. (Dr. Hawkes and Dr. Koppel, I.A.B.) Chromosome counts were made of 184 lines during the year, whilst 191 samples have been taken for sectioning and counting during the early part of 1947.

(3) Virus diseases. (Dr. Wortley and Dr. Koppel, I.A.B.) All lines previously classed as healthy have been checked for freedom from virus by the usual methods. Out of 481 lines in this category only 21 appear to have contracted a new infection and it is evident that with the present glasshouse accommodation the spread of viruses is very largely under control. The virus contents of 108 diseased lines were further investigated. 232 of the new accessions to the E.P.C. were tested before frost put an end to this work; 25 per cent. were classed as healthy. Experimental material and 257 lines from Germany have brought the total of clones tested during the year by sap inoculation (and in some cases by grafting) to 1,300. An undescribed South American virus present in certain E.P.C. lines was found in three of the lines from Germany. 183 lines have been tested for resistance to virus Y, including 47 which showed promise in 1945. The great majority of the latter proved to be susceptible on further trial, and of the 194 lines which have now been tested 17 have failed to accept the virus, three of them (one not a tuber-bearer) on more than one occasion. In addition, 13 lines developed a rapidly lethal systemic necrosis when infected, and one appeared to possess the normal type of field immunity.

(4) Wart Resistance. (Mr. Samuel, Ministry of Agriculture and Fisheries, Plant Pathology Laboratory, Harpenden, Herts.) Of 59 lines supplied in September, 1945, 38 proved susceptible while 21 escaped infection. Of 166 lines supplied in October 1945, 35 proved susceptible while 131 escaped infection. In the latter case the test was not so rigorous and the resisters are being retested before being classed as immune. 300 lines have been supplied from the 1946 harvest, including 104 lines for retesting.

(5) Blight Resistance. (Dr. Keay, I.A.B.) Preliminary work was initiated on the technique of testing for blight resistance, and observations were made in the field on the incidence of blight on the E.P.C. A technique has been worked out for testing tuber resistance and for maintaining the blight fungus in culture.

(6) Eelworm Resistance. (Dr. Ellenby, King's College, Newcastle-on-Tyne.) 308 lines were supplied for testing in 1946. The wild species, *S. Ballsii*, which had remained free from eelworm attack in 1945, became slightly infected but there was no cyst formation, indicating that some type of resistance exists in this species. A further experiment was set up in the glasshouse under the direction of Dr. Ellenby to ascertain whether there was any difference of eelworm attack between plants grown under long and short days. One domestic and one E.P.C. variety were used in this experiment.

(7) Frost Resistance. (Mr. Driver, I.A.B., working at the Low Temperature Research Station, Cambridge.) Considerable difficulty was experienced in obtaining the

requisite conditions for frost testing in 1946, with the result that although several hundred plants were put through the freezing chamber, no reliable results were obtained and the tests were finally discontinued. The temperature of the pre-cooling chamber (the only one available) varied from 2° C. to —2° C., the lower temperature being much too low, since plants taken from the freezing chamber did not thaw, while the soil in the pots froze, causing further complications. It is doubtful if much progress can be made beyond the preliminary test now more or less completed without the provision of a specially designed freezing chamber as suggested at the I.A.B. conference in July.

(8) Chemical Constitution. (Miss Morgensternova and Dr. Koppel, I.A.B., and others.) This season's work consisted mainly of tests upon the influence of environment, stage of maturity and virus diseases upon the ascorbic acid content. Similar relative differences were found between varieties (domestic and E.P.C.) when grown in both Cambridge and Balerno, and also when harvested at three differing periods of maturity. Altogether 1,255 analyses were made for ascorbic acid content by a new micro-analytical method. Moisture determination of the E.P.C. material used in ascorbic acid tests were done by Dr. Koppel. During the winter (1945–46) 711 analyses for nitrogen content were done on dried material.

(9) Photoperiodism. (Dr. Hawkes, I.A.B.) Further experiments on " bolter " and normal domestic potatoes were carried out. The results have confirmed that the " bolter " condition is due to a gene or genes controlling the photoperiodic response.

(10) Field Work.

(*a*) 531 tuber lines, 51 seedling lines and 71 domestic varieties were planted, giving a total of 2,920 plants. The season was wet and the field not well drained so that the plants were backward in establishment. It has been decided to move to a more suitable plot in 1947. The plot was visited during the year, pollinations made, notes taken and material collected for herbarium specimens. Samples of tubers were used for biochemical, blight resistance and other tests and for distribution.

(*b*) Trials were laid down for the following purposes :

(i) To test the constancy of varietal differences in vitamin C content, the effect of environment and stage of maturity at harvest.

(ii) The effect of virus disease upon vitamin C content.

(iii) The effect of " vernalization " upon establishment and yield. Trials (i) and (ii) were planted also in Scotland. Growth was good and yields much above normal although there was some blight upon the later harvested material.

(11) Seed Production. This past year was on the whole very poor for seed production, particularly on the outside plots. A total of 465 pollinations were made, including some by Dr. Pushkar Nath. 231 lines of seed were obtained as well as a number taken by Dr. Pushkar Nath to India.

Potato Material Distribution during the period 1st January to 31st December, 1946 :—

A. Empire Overseas—

Destination	*No. Vars.*	*Tubers*	*Seed Samples*
Australia	28	66	—
Canada	47	93	—
South Africa	121	361	2
India	38	69	1
Gold Coast	9	19	6
Nigeria	22	75	—
Hong Kong	16	27	—
Eire	13	49	—
B. British Isles—			
Wales (Prof. Roberts, Bangor)	10	40	—
N. Ireland (Mr. J. Clarke)	1	2	—
Scotland (Dr. W. Black)	27	50	—
,, (Dr. Cockerham)	1	2	—
,, (Dr. McIntosh)	22	109	—
England (Dr. Bell)	6	27	—
,, (Drs. Carson and Howard)	15	47	20
,, (Dr. Ellenby)	308	708	—
,, (Dr. Gault)	6	26	—
,, (Prof. Kay)	13	42	—
,, (Mr. Munro, N.I.A.B.)	—	—	2
,, (Mrs. McDermott)	18	40	—
,, (Mr. Samuel)	300	1,491	—
,, (Dr. T. W. Tinsley)	6	23	—
	1,027	3,366	31
C. Other Countries—			
Czechoslovakia	16	42	—
France	—	—	29
Poland	9	28	14
U.S.S.R.	6	19	—
Argentina	22	59	—
	53	148	43
Non-potato material distributed—			
India	2	4	—
Nigeria	16	64	—
Hong Kong	16	30	—
England	—	—	16
	34	98	16

Potato Material Received 1st January to 31st December, 1946.

A. Empire Countries—

Source	*No. Vars.*	*Tubers*	*Seed Samples*
South Africa	10	25	—
Transvaal	1	2	—
Tanganyika	3	24	—
Eire (Dr. Delaney)	31	155	—
N. Ireland (J. Clarke)	1	3	—
Scotland (Dr. W. Black)	3	18	—
,, (Dr. McIntosh)	4	—	—
,, (Mr. Findlay	36	144	—
England (Mr. Gault	22	72	—
,, (Dr. Howard)	2	6	—
	113	449	—
B. Other Sources—			
Argentina	50	158	—
Bolivia	9	33	4
Peru	277	319	—
Venezuela	3	14	—
Czechoslovakia	1	4	—
Germany	245	424	—
	585	952	4
Non-potato material received—			
Bolivia	—	—	1

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